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Exploring peer relationships, friendships and group work dynamics in higher education: applying social network analysis

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ABSTRACT

This study primarily applied social network analysis (SNA) to explore the relationship between friendships, peer social interactions and group work dynamics within a higher education undergraduate programme in England. A critical case study design was adopted so as to allow for an in-depth exploration of the students' voice. In doing so, the views and perspectives of students were sought through a questionnaire. The study is informed by a social capital theory perspective along with the idea of student relational agency within a social network perspective. Data were analysed by using a combination of methods, including SNA, descriptive statistics and thematic analysis. The initial findings suggest that students are, on the whole, positive about group work but, at the same time, acknowledge many potential barriers when working in groups. More importantly, a dynamic interrelationship between friendships/peer relationships and group work dynamics was found.

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Group work; social network analysis; higher education; friendships; peer relationships

Introduction

The principal aim of this research study was to apply Social Network Analysis (SNA) to explore the link between students' peer relationships and friendships, on the one hand, and group work dynamics on the other. In doing so a critical case study design was employed in collecting the data from first-, second- and third-year students within the same university programme in England. A class of students is a group which consists of friendships, peer interactions, relationships, tensions and overall dynamics that can be positive, negative or even neutral. A central aspect of the academic experience of students relates to group work and collaborative learning. The educational benefits of students working cooperatively in groups are well recognised. Group work and student collaboration have been shown to 'directly enhance learning; employers value the teamwork and other generic skills that group work may help develop; and group activities may help academic staff to effectively utilise their own time' (Devlin 2015, 15). However, the relationship between, and importance of, friends, peer social and learning networks and overall group work dynamics in Higher Education (HE) is an area that is relatively under-researched despite the fact that 'social interaction with peers has long been recognised as one of the critical factors for facilitating the learning process' (Gašević, Zouaq, and Janzen 2013, 2).

This piece of pedagogic research is particularly timely due to the increasing tensions observed among students within this programme, especially when working in groups, which inevitably has a detrimental effect on the academic outcomes and well-being of some of those students. The findings of the study are expected to contribute to the agenda on HE research-informed teaching. The area of

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group work has various pedagogical implications as this is reflected in the Study Process Questionnaire (SPQ) and National Student Survey (NSS) results of most universities in England. Therefore, the present study had two main research questions:

(1) What is the relationship between friendships, peer social interactions and group work dynamics across the three year groups?
(2) What are the benefits and challenges of group work as perceived by students?

It is important to highlight here the conceptual difference between social acceptance and friendship within this study. According to Bukowski and Hoza (1989), peer acceptance is a general group-oriented, unilateral construct that represents the view of the group towards an individual, whereas friendship is a bilateral construct that refers to a reciprocal relationship between two people with both affirming it. The mutuality or reciprocity of affection is crucial as this distinguishes friendship from one student's desire to be liked by a peer, when that other student does not return the preference (Dunn 2004). This conceptual difference was explained to students prior to them completing the questionnaire.

The study introduces social capital theory and related ideas as a lens to explore and understand how patterns of interpersonal relationships among students can support or constrain efforts at group work improvement. Methodologically, SNA combined with qualitative data potentially presents a novel approach to examining group work. Bringing together quantitative and qualitative insights can be powerful as a research approach in HE.

Group work in HE

Group work and subsequent group-based learning is increasingly being used in HE, as it has become recognised as a powerful tool to support learning. It encourages students to become actively engaged with their learning and knowledge base as they begin to think and articulate their views with others. Actively engaging students in the learning process, through group discussions and interactions, can also provide conditions for deep learning (Entwistle and Peterson 2004). Gibbs (1995) argues that group work promotes the development of a range of skills such as negotiation, communication, respect, empathy and collaboration. These transferable skills, coupled with in-depth subject knowledge, help to prepare HE graduates for the workplace. Furthermore, international students embrace group work as an opportunity to interact directly with home students, yet the mixed responses of home students to intercultural groups can be a source of disappointment (Cotton, George, and Joyner 2013). Group work also contributes to students' social integration and sense of belonging, both identified as important to student well-being (Jaques 2000). Encouraging a sense of belonging is key towards widening participation and inclusion of all students in HE (Cotton, Kneale, and Nash 2013). Overall, Curşeu and Pluut (2013) maintain that collaborative learning has important group-level benefits.

Despite the well-articulated benefits of group work, Gibbs (2010) notes that most forms of teaching and assessment used in HE promote independent study and a focus on personal achievement. Therefore students need to be encouraged to recognise these wider benefits and supported to engage effectively in group work. The role of tutors is critical towards this. Therefore integrating group work requires careful planning and preparation, and tutors have a central role in promoting, managing and mediating students' group work experiences (Gibbs 1995). Examples of group work that have been examined within this study include seminars, tutorials, study/discussion groups, group presentations, collaborative writing and group activities in a lecture.

Theoretical context

The study draws on the concepts of social capital theory, social network theory and relational agency. In doing so, relevant notions relating to group work and inclusive pedagogy in HE are discussed.

Social capital 'draws attention to the effects and consequences of human sociability and connectedness and their relations to the individual and social structure' (Tzanakis 2013, 2). Despite the fact that the notion of social capital has been gaining popularity in educational and multidisciplinary research, defining it is not easy. This study is primarily driven by Bourdieu's ideas on social capital. According to Bourdieu (1986, 248), social capital is defined as 'the aggregate of the actual potential resources which are linked to possession of a durable network of more or less institutionalised relationships of mutual acquaintance or recognition'. For Bourdieu, 'social capital is related to the size of network and the volume of past accumulated social capital commanded by the agent' (Bourdieu 1986, 249). 'The fundamental notion of social capital is that social relationships provide access to resources that can be exchanged, borrowed and leveraged to facilitate achieving goals' (Moolenaar, Daly, and Sleegers 2012, 92). Moolenaar, Daly, and Sleegers (2012) maintain that social capital belongs to the family of 'intangible assets' that can be accrued and leveraged by groups, individuals or systems (92). Interpersonal social relationships and friendships among students can be very important as they provide access to information, knowledge and expertise (Frank, Zhao, and Borman 2004), confidence and a sense of belonging.

'A valuable starting point for understanding how social capital is generated through the pattern of interpersonal relationships is social network theory' (Moolenaar, Daly, and Sleegers 2012, 92). Social network theory is primarily concerned with the pattern of social relationships that exists between people (students) in a social network (Scott 2013). It builds on the notion that social resources such as information, knowledge and expertise are exchanged through informal networks of relationships between actors in a system; as such, these networks can facilitate or inhibit access to social capital (Moolenaar, Daly, and Sleegers 2012). Social networks among students may support or constrain the exchange of resources that can be accessed and leveraged to achieve goals. Christakis (2010) argues that social networks have value as they are a kind of social capital.

This social network perspective adds to our understanding of how interpersonal peer relationships and friendships among students impact on group work. According to Moolenaar, Daly, and Sleegers (2012), at least three assumptions underlie social network theory and the resulting social network research. These three assumptions drive this study. First, the notion of social embeddedness implies that actors in a social network are interdependent rather than independent. Second, interpersonal relationships are regarded as conduits for the exchange or flow of resources such as information, knowledge and materials. Third, patterns of interpersonal relationships may act as 'constraints' or offer opportunities for individual and collective action.

The capacity of students for working together, i.e. group work, is seen as important in developing their academic and professional practice and maintaining an increased psychological and socio-emotional well-being. Therefore, the notion of relational agency is also central to the arguments made in this study. Edwards (2005) defines it as 'a capacity to align one's thought and actions with those of others in order to interpret problems of practice and to respond to those interpretations' (169–170). In other words, 'relational agency involves a capacity to offer support and to ask for support from others' (Edwards 2005, 168).

Overall, the notion of agency refers to a person's capacity to perceive personal goals towards which one is directing action (McAlpine and Amundsen 2009). Cornelissen et al. (2015) highlight the debate in the literature as to what extent individual actions are determined by an individual's own beliefs or are influenced by the structure in which they reside. This is quite central in this study in terms of students' actions in relation to group work. As Datnow (2012) suggests, this study is driven by a relational interdependence between individual agency and the social world in the ways that social structure and individual agency are mutually shaping each other. Therefore, I recognise that students' beliefs and actions might have an impact on the quality of group work undertaken but, at the same time, the ways that group work is organised and structured within the programme can also have an impact on students' agency and ability to engage in group work. Hence, relational agency can play an important role in students becoming more competent and confident with group work as it involves their ability to seek out other people to collaborate with and jointly undertake complex tasks.

Method

A critical case study design

The research employed a critical case study design (Yin 2009). According to Bryman (2012, 70), 'here the researcher has a well-developed theory, and a case is chosen on the grounds that it will allow a better understanding' of the theory. Yin (2009) argues that 'theory development as part of the design phase is essential' (35) and should take place 'prior to the collection of any case study data' (36). The benefit of this is a stronger design and an increased ability to interpret the data (Yin 2009).

Yin (2009) argues that using case studies in social science research can be very challenging and the researcher should be able to understand both the strengths and limitations of such a design. The primary justification for using a case study design is because it allows for an in-depth exploration (Yin 2009) of both the case in question and the overall issue. According to Bryman (2012), this design entails the detailed and intensive analysis of a single case. However, one of the main criticisms of this design is that it cannot be generalised (Bryman 2012). My intention was not to generalise the findings but to generate an intensive exploration of the critical case in question so that I could engage in a theoretical analysis. Therefore, the findings from this study cannot be generalised due to the 'situational uniqueness' of the case (Stake 2006, x) but can potentially reveal valuable insights into group work dynamics in HE that may be relevant to other similar contexts. What is methodologically more important here, is the use of SNA combined with qualitative insights gained through a social network questionnaire as a research method in HE. More details about this approach follow.

Stake (1995) has described a case study as one in which the case itself is of primary importance. Within this study, both the case in question – an undergraduate programme of studies with its own complexity and particular nature – and the overall issue – group work – are important. I have designed and conducted a critical single case study to explore group work dynamics and the relationship between friendship and learning networks among the students of that particular case. At the same time, I intended to explore what students find particularly good or challenging about group work and why. In doing so, I wanted to employ SNA as a tool for undertaking research in HE and try this out within a case study design.

Applying SNA in collecting and analysing the data

According to Borgatti, Everett, and Johnson (2013), 'networks are a way of thinking about social systems that focus our attention on the relationships among the entities (usually called actors or nodes) that make up the system' (1). Hence, SNA conceptualises individuals, students in this case, as 'points' or 'actors' and their relations to each other as 'lines' or 'ties' (Scott 2013). This study applied SNA in exploring friendships, social interactions and group work dynamics among undergraduate students as it offers a number of advantages and presents a novel methodological approach in HE research. The idea of investigating friendships and choices for group work was framed by asking students to nominate their friends and the classmates whom they would like to engage with in group work activities. The structure of both the friendships and group work networks is important as it is revealing of students' interdependencies and provides insights into how these networks were developed. Network-level analysis is moving beyond the traditional dual relationship between two students and provides a bird's-eye view of the whole network within a group of students. Network data allow researchers to assess the overall social structure of the system and to locate particular individuals' positions within the system (Wasserman and Faust 1994). Comparing the two networks (friendships and group work) can potentially help tutors take pedagogical decisions to improve teaching and learning. The SNA approach in conjunction with qualitative data represents the added value of this paper.

'Network data can be collected from either primary or secondary sources' (Borgatti, Everett, and Johnson 2013, 29). In terms of primary data collection, a questionnaire was employed with both closed and open-ended questions. A more detailed description of the instrument is provided later. No secondary data have been collected. Case studies often employ qualitative methods but increasingly

they employ both quantitative and qualitative research data (Bryman 2012). Initially, semi-structured interviews with some of the students had been planned. However, in order to give voice to as many students as possible the core interview questions were incorporated into the questionnaire in preference to conducting individual interviews. The questionnaire was then piloted and the final version of it was distributed both on paper and online. In total, 77 questionnaires were collected, resulting in a response rate of 49.7%. Out of the 77 students, 26 (of 55) were first year, 18 (of 52) second year and 33 (of 48) third year. In social network research, a response rate of about 80% is required for more accurate social network analysis (Neal 2008). However, it is possible to conduct social network research with a lower response rate if the researcher puts in place methods for dealing with missing data and potential non-response bias (Neal 2008). For example, data triangulation may partly resolve the issue as well as statistical checks. Both methods were implemented in the present study. Data from parts 2 and 3 of the questionnaire were triangulated with social network data from part 1. A 50% response rate in a survey questionnaire (parts 2 and 3) is generally considered a good response rate. In terms of statistical checks, the technique of reconstruction was employed which allows researchers to assign a relationship between actors/students on the basis of description of the relationship by only one of the actors (Neal 2008). After applying reconstruction to the network data across all year groups the new social networks accounted for over 80% of the possible relationships within the networks. What is even more important in counting towards the validity of the data is the researcher's deep knowledge of the students and long ethnographic relationship with them. If this had not been the case, then reconstruction would not have been applied.

The majority of students were female white British and studying full-time. A very small percentage of students are international and male due to the nature of the programme. In order to avoid potential identification of students in the presentation of results, gender and ethnicity of students intentionally remained undisclosed during analysis. Census sampling (Borgatti, Everett, and Johnson 2013) was employed, meaning that all students of the particular programme were invited to participate. Data were collected during the second semester of the 2014–2015 academic year. This means that groups were likely to be well established by that time in the year, especially for second- and third-year students. It has to be noted here that data collection occurred only once. Therefore, this is a 'snapshot' of the social and academic networks of students rather than a longitudinal overview. It is widely acknowledged that networks are dynamic rather than static, so the interpretation of the findings is done with this in mind.

Questionnaires are a useful way to access a wide range of views, relatively quickly and in an economical manner (Hohmann and Mamas 2015). Bryman (2012) also highlights the advantages of such a method; questionnaires are cheaper and quicker to administer, convenient, interviewer effects are absent and there is no interview variability (233–234). However, disadvantages of questionnaires may include the researcher's inability to prompt, probe, ask many questions that are not salient to respondents or collect additional data (Bryman 2012, 234–235).

The questionnaire was divided into three parts. The first social network part consisted of two network concentric circles (Figure 1) where students were asked to write the names of those fellow students who considered them as their friends (social criterion) and those they wanted to work with during a group work activity (academic criterion). Students were asked to write the names of their closest friends within the inner circle and in a similar manner write the names of the rest of their friends (less and least close) in the outer two circles. Examples of friendship were provided to students on the questionnaire: mutual trusting relationship, seeking advice from, undertaking social and extra-curricular activities together. The advantage of this technique is that it allows for tie strength to be captured, which is important in network research (Borgatti, Everett, and Johnson 2013). I asked students to write only the names of friends that were within their year group, as the year group was the unit of analysis. In the second concentric circle, students were asked to choose classmates whom they wanted to work with in a group work activity. The second part comprised a rating scale (Table 2) about students' views on group work and social interaction as well as other closed questions regarding preference on type of group work, grades and other matters. The third qualitative part consisted of open-ended questions. Students were asked to describe what they like most and least about group work as well as any positive or negative

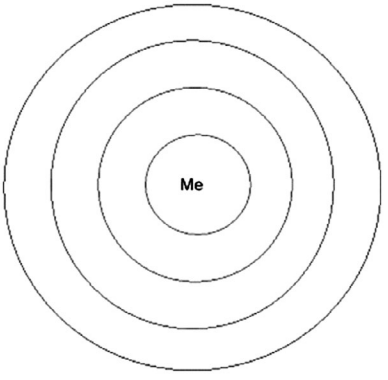

Figure 1. Friendships and group work concentric circles.

Table 1. Association between friendship and group work networks by QAP correlation.

Year 1	Pearson correlation	**0.3644****
Year 2	Pearson correlation	**0.5661****
Year 3	Pearson correlation	**0.7492****

*$p < 0.05$; **$p < 0.001$; ***$p < 0.0001$.

Table 2. Basic statistics.

	Median	Mean	St. Dev.
When given a group work task, I prefer to work with friends	2.00	1.76	0.97
Group work promotes my learning	2.00	2.50	1.12
I enjoy working in groups	2.50	2.62	1.20
In a group assessed task, all group members should get the same mark	4.00	3.89	1.43
It would benefit me to work with students that I don't usually work with	3.00	3.17	1.15
Group work helps me make new friends	2.00	2.51	0.93
I would benefit from working with students I don't usually work with	3.00	3.03	1.15
I feel happy when involved in group work	2.00	2.59	1.00
Since being a student at the University, my group working skills have improved	2.00	2.09	0.81
I would have liked more support from tutors in group work tasks	2.00	2.43	1.03
Some members of my group participate less than others	2.00	1.91	1.00
Some members of my group dominate the group more than others	2.00	2.04	0.94
For group work I feel it is important that individual contributions are reflected in the final mark	2.00	1.84	0.87

experiences when working in groups. A particular strength of such a design was that it offered a variety of questions to students that were simply worded, short and engaging. This enabled for both quantitative and qualitative data to be collected which fits well with the critical case study design (Yin 2009).

As a result, three different strategies were employed to analyse the data. The first part was analysed by employing SNA to explore the friendship and group work networks of students and the relationship between the two. SNA serves as a useful quantitative method to investigate relational constructs that are often difficult to capture and measure by conventional social sciences methods (Borgatti, Everett, and Johnson 2013). NetDraw was employed to generate visual representations of the networks and UCINET was used to calculate the QAP correlations. Part two was analysed by using descriptive statistics generated by the SurveyMonkey statistical software. It is worth noting here that all questionnaires had been input into SurveyMonkey for both data management and analysis. The third qualitative part was analysed thematically. Thematic analysis is defined by Bryman (2012) as the process of examining data to extract core themes.

Ethical considerations

The project received ethical approval by the relevant university ethics committee. From day one of this research study, ethical issues were taken into full consideration so as to protect participants from any possible psychological harm. Prior to completing the questionnaire, students were given a project information sheet where their right to withdraw from the study at any point within three months of data collection was made clear. Withdrawing a questionnaire was possible within the study as questionnaires were not anonymous due to the nature of social network research. This was ultimately the most challenging part of the data collection phase. According to Borgatti, Everett, and Johnson (2013), network researchers can only offer confidentiality to respondents and not anonymity. Therefore, all names have been replaced by numbers and only I, as the researcher, have access to the raw data. This was made clear to participants prior to them completing the questionnaire.

Findings and discussion

The two research questions, as previously outlined, formed the basis for data analysis and discussion.

Relationship between friendships, peer social interactions and group work dynamics

In the first part of the questionnaire, participants were asked to nominate their fellow students whom they considered as being their friends (friendship circles) and those whom they wanted to work with (group work circles). To make it more simple, students were asked to provide nominations of only classmates within the same year group. In some cases, students nominated non-classmates. These nominations have not been taken into consideration in the analysis. The in-classroom nominations were mapped by employing NetDraw and the visualisations in Figure 2 were produced for Year 3. Year 1 and Year 2 visual networks also were produced (see Appendices 1 and 2) but the Year 3 networks are being presented here.

Each number within a square represents a student. The size of squares is defined by degree, meaning the sum of nominations received from other students and sent to other students. The bigger a square is, the more nominations a student received and sent out. An arrow connecting two circles denotes a nomination of a friendship or a group work dynamic according to students' responses in the questionnaire. A double-edged arrow means a mutual nomination/tie. The thickness of the arrow shows the 'closeness' or tie strength of the friendship or group work dynamics (see Figure 1). By looking at all friendship and group work networks across the three years, it seems that there is an interrelationship between friendships and group work dynamics. As shown in Figure 2, the two main friendship clusters of students are reflected on the group work network too. The more central students (2, 4, 5, 6) on the friendships network seem to also be central on the group work network, which begins to suggest a dynamic relationship between students' nominations on both networks. It seems that students prefer to work with their friends and that they probably make new friends when they work in groups. For example, pairs of students such as 6–26, 4–8, 1–16, 6–27, 7–8 and others have a reciprocated relationship in both networks. A very similar pattern is observed in the Years 1 and 2 networks (see Appendices 1 and 2). These networks are more dense in terms of both number of students and relational ties. Studying those networks closely, we can see that there is a high similarity between the friendship and group work networks.

Despite the seemingly visual interrelationship, the QAP correlation was used to examine whether there was a statistically significant relationship between the two networks with the same actors/students. According to Hanneman and Riddle (2005), QAP correlation calculates the association between the relations in two matrices. In other words, I wanted to see if the ties between students in the friendships network were related to the existing ties in the group work network and vice versa. The assumption therefore was that friendship and group work dynamics were positively correlated across all three year groups. Perhaps not surprisingly, the strongest positive correlation was found in the third year whereas

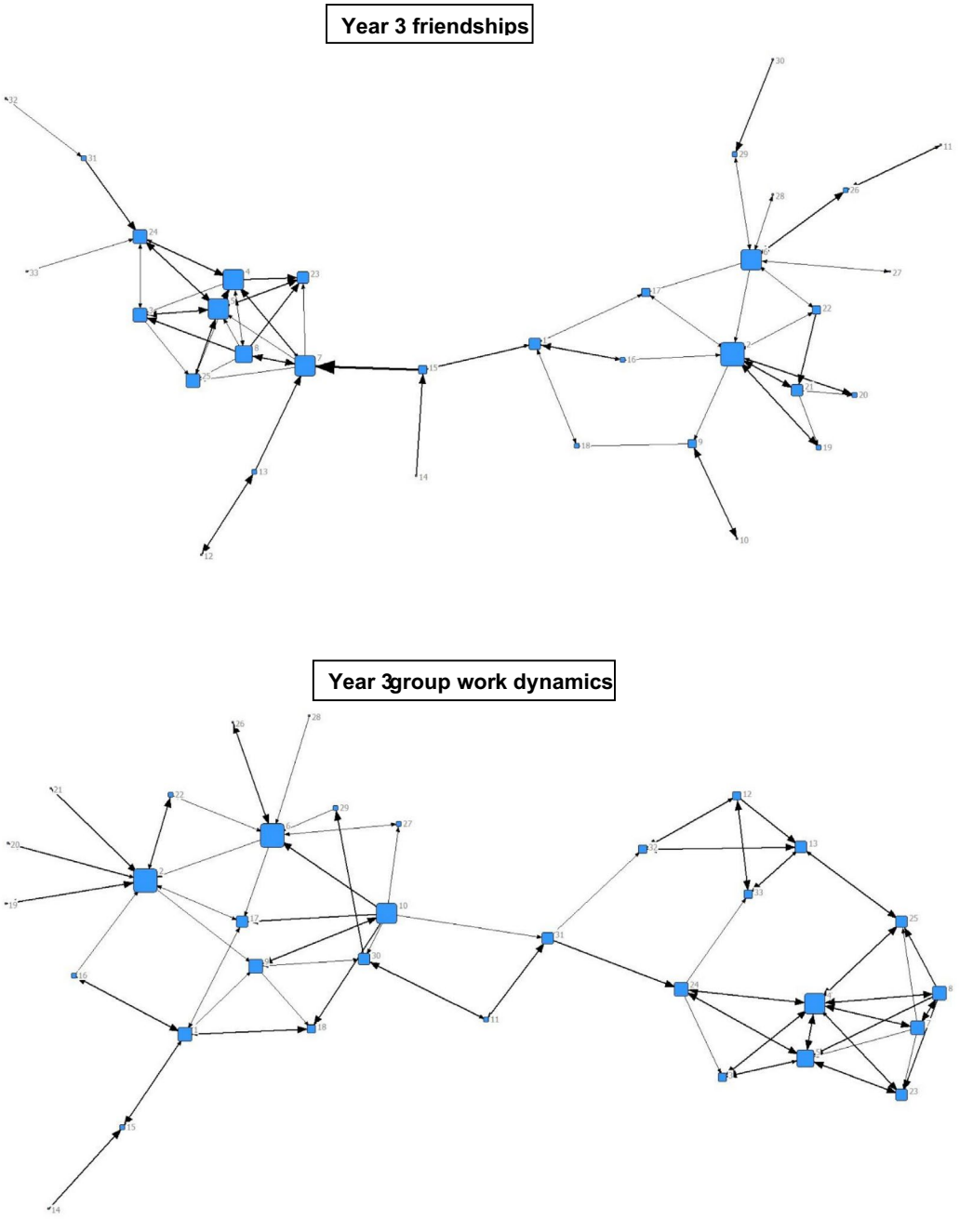

Figure 2. Visual networks of Year 3 friendships and group work dynamics.

the weakest was found in the first year of studies. This shows that the relationship between the two networks gets more established as students spend more time together. In the first year of studies, students seem to have more relational ties whereas in the second year these relational ties seem to become more solidified but still in large numbers. In the third year, students seem to have more solid networks and focus more on academic aspects in order to achieve a good degree classification, hence the highest Pearson QAP correlation is exhibited in this year.

As shown in Table 1, a statistical significance has been found across all year groups which shows a positive relationship between friendship and group work networks, therefore suggesting an interrelationship between the two. This is significant evidence in addressing the first research question but again it is worth noting that the generalisability of these findings is very limited as this is only a case study with a single round of data collection. As highlighted before, networks should be seen as dynamic rather than static and rigid. Perhaps it is more important to look at the pedagogical implications of the findings. During the first year of studies, students seem to be more open to forming new friendships and working with different people while engaging in group work. By the third year, it seems that those networks are well established and not easily permeable. Third year students in England are working towards finalising their degree and they focus more on their grades rather than on social aspects of their academic life and experience. For example, a third year student said: 'some people don't deserve the marks or drag you down, particularly annoying in third year'. It is worth noting that in universities in England, the final (third) year grades are the most important towards the final degree classification. Therefore, as these findings suggest, lecturers and programme leads should be paying more attention to group work dynamics and friendships when students are in the early stages of their university studies. This is however not to suggest that during the second and third years group work interventions should be avoided or undermined.

These important findings also are supported by the students' responses to the open-ended questions within the questionnaire and the theoretical framework of this study:

> I think it's easier and more comfortable to work with your friends, but then again working with people you that don't know puts you out of your comfort zone and encourages you to make new friends. (Year 1)

> Ideally I like working with a couple of friends but also people I am not friends with because this does give you a chance to form a relationship with other members of the group you have previously not spoken to as much as you do with your friends. (Year 2)

The general cross-year mean (see Table 2) average of the scale item 'When given a group work task, I prefer to work with friends' is 1.76 which shows high agreement to the statement (1: strongly agree, 6: strongly disagree). Whereas the statement 'It would benefit me to work with students that I don't usually work with' had a mean average of 3.17 which shows much less agreement than the first statement. This evidence highlights that students prefer to be working with their friends during a group work task. However, many students emphasised that group work provides many opportunities to make new friends (mean average: 2.51). Across the three year groups a lot of students argued that one of the things they like most about group work is that it provides many opportunities to 'make new friends', 'meeting new people', 'developing ideas with peers', 'getting to know people', 'socialising', 'building on friendships/making connections'. These findings suggest that group work can also be conducive to generating peer social interactions among students and forming friendships.

When asked about what could be done to improve their experience in terms of working in groups, some students said that they prefer to work with friends:

> I think that forcing us to work in groups with people we don't necessarily know might hinder our group work. If we work with friends we feel more comfortable when asking people to pull their weight. (Year 1)

> Get to pair up with friends. (Year 2)

> To allow us to choose our groups with 1 or 2 people we haven't worked with before to allow us to get to know other people on our course. (Year 2)

However, other students argued that their lecturers should decide upon the formation of groups:

> Instead of choosing who you work with, lecturers should choose who you work with in order to avoid working with those you are friends with. Group you up with those you may not have worked with. (Year 2)

These views are reflected on the visual networks produced across the three years of studies. The majority of students prefer to work with their friends but some of them prefer to work with fellow students that they do not know well so that they get to know each other better. This is revealing of the interactive relationship between friendships and group work dynamics. However, it has to be

emphasised again that this is a case study and findings cannot be generalised across the spectrum of undergraduate HE programmes.

Driven by social capital and social network theories, these findings can be interpreted in a number of ways. It is evident that students who possess a central position in the social/friendship network do so in the group work network across all three year groups. As Christakis (2010) notes, social networks and social relationships among students are a kind of social capital. Kadushin (2012) argues that 'social networks have value because they allow access to resources and valued social attributes such as trust, reciprocity, and community values' (164). The increased social peer relationships and friendships, and subsequently social capital of those students, seem to be providing access to resources that can be exchanged, borrowed and leveraged (Moolenaar, Daly, and Sleegers 2012) to facilitate achieving group work more successfully. Interpersonal social relationships, including friendships, or the absence of them, can be very important during group work as they provide access to information, knowledge and expertise (Frank, Zhao, and Borman 2004) as well as affection, advice and affirmation (Deal, Purinton, and Waetzen 2009). Therefore, students with increased 'relational agency' (Edwards 2005, 168) seem to be able to offer support and ask for support from others when they need it during group work activities. Other students who are on the periphery of the social networks seem to remain marginalised within the group work networks too. This is likely to have a knock-on effect on those students' sense of belonging, which is key in working towards widening participation and inclusion of all students in HE (Cotton, Kneale, and Nash 2013). Gašević, Zouaq, and Janzen (2013) note similar findings in a Canadian context. They examined 'students' social capital accumulated through their course progression' and found that it is 'positively associated with their academic performance' and that 'students with more social capital have significantly higher academic performance' (1460). Therefore, social ties among students should be encouraged and promoted throughout the degree programme as they seem to have a positive impact on academic outcomes. Similar findings are reported in other studies that focus on international students (Rienties and Nolan 2014; Hendrickson, Rosen, and Aune 2011).

Benefits and challenges of group work

Participants identified many benefits and challenges when engaging in group work activities. Primarily, benefits related to relational, psychological, social and emotional aspects of academic life as well as learning. When asked what they like most about group work, some students emphasised gains in confidence, communication skills, learning from each other, sharing ideas and making new friends:

> I find it useful for boosting confidence, especially when presenting as it is less daunting when you present with a group of people rather than on your own. (Year 2)
>
> Sharing ideas. (Year 1, Year 2, Year 3)
>
> Learning from each other. (Year 1, Year 2, Year 3)
>
> Helping each other in a positive way. (Year 2)
>
> Working together improves discussion, having a group to support each other, builds confidence. (Year 3)
>
> I have learnt new opinions and my ideas have been transformed from good to great with others to help me brain-storm. (Year 1)
>
> Positive energy and communication. (Year 1)
>
> We all supported each other, did what we promised and sorted the work ahead of deadline. (Year 1)
>
> It takes the pressure off you, as you have the support of each other. (Year 2)
>
> You can share the workload and share the stress as well. (Year 1)
>
> Making new friends. (Year 1, Year 2)

These findings are in line with other studies (Entwistle and Peterson 2004; Gibbs 1995, 2010; Jaques 2000; Thomas 2002). For example, Entwistle and Peterson (2004) note that group work can provide conditions for deep learning whereas Gibbs (1995) found that group work promotes the development of a range of skills such as negotiation, communication, respect, empathy and collaboration. As shown throughout this study, group work also helps in enhancing students' friendships and social relationships as well as sense of belonging which in turn improves students' well-being (Jaques 2000). In light of performativity, neoliberalist and employability agendas, increased pressure is placed upon students to maximise their learning gain throughout their university studies. McGrath et al. (2015) define learning gain as the 'distance travelled', or 'the difference between the skills, competencies, content knowledge and personal development demonstrated by students at two points in time' (xi). It is important however for HE institutions to embrace group work learning even more as it seems to be offering opportunities for enriching the social capital of students, thus enhancing their overall learning gain. Three main challenges of group work that were reported by participants included 'people not pulling their weight', assessment and support from tutors/lecturers. An important underlying theme that came up is related to students' contributions and marking/assessment of group work. On the scale item 'For group work I feel it is important that individual contributions are reflected in the final mark' the mean average was 1.84 (see Table 2) which represents a very strong agreement to the statement. The conceptually opposing statement 'In a group assessed task, all group members should get the same mark' yielded a high mean of 3.89. Many participants expressed their frustration with the current status quo in many modules where all students in a group receive the same mark despite the fact that some of them might not 'pull their weight' or contribute equally. In fact, as Gibbs (2010) argues, 'the assessment of group work is one of the biggest sources of student dissatisfaction, largely because it is often perceived as unfair' (n.p.):

> Not everyone should get the same mark if they haven't contributed that much. (Year 2)
>
> People not contributing equally. (Year 2)
>
> Some people don't deserve the marks or drag you down, particularly annoying in third year. (Year 3)
>
> Getting marked down because of others. (Year 1, Year 2)

This finding has important assessment implications. While group work may be beneficial, groups 'can get a fouled up on the way' (Light, Cox, and Calkins 2009, 136). It is therefore important for group work assessment to be accomplished in a careful and pedagogically just manner. Gibbs (2010) notes that assessing group work is a contentious issue which has implications for the level of student engagement. He suggests that tutors should consider whether they are assessing the product or the process of group work, or both (Gibbs 2010). Driven by the findings of this study, it is recommended that lecturers find ways to assess both the product and process of group work as well as individual and collective contributions.

Support from tutors emerged from the data as another key theme. When asked about what they would most like to change in group work, many participants emphasised the role of tutors/lecturers in facilitating group work:

> Tutor should check more how you are getting on. (Year 2)
>
> Clearer instructions and expectations from tutors. (Year 3)
>
> More support from tutors. (Year 1, Year 2, Year 3)
>
> Work load being shared equally maybe by lecturers. (Year 2)

Another potential negative of group work is the dominant behaviour of some students. Students seem to strongly agree (mean average: 2.04) that some members dominate the group more than others (see Table 2). These findings suggest that tutors, in collaboration with students, should find ways to monitor the process of group work as well as setting clear expectations. Mechanisms could include 'students creating a diary or schedule of meetings, recording minutes and action points that capture progress'

(PU 2013, 2). A more systematic monitoring of group work coupled with more support from tutors may help mitigate issues with assessment and improve group work dynamics.

Conclusions and recommendations

This research project has generated many insights into how group work dynamics are shaped within one undergraduate programme in HE by combining SNA with qualitative data. Friendships and peer relationships have been found to influence group work in a positive manner and vice versa. There is a substantial interrelationship between friendship and group work networks. Network data showed that students prefer working with their friends in group work activities. This relationship is particularly strong in the second and third years of studies where friendship and learning groups are more established and solid. Year 1 students seem to be more susceptible to shaping friendships through directed group work activities and this has many pedagogical implications. Overall, many students generate new friendships through engaging with fellow students in group work tasks and this is one of the main strengths of group work, along with other academic benefits. Despite the widely acknowledged benefits of group work from the participants, it seems that many challenges still remain that call for a more systematic and inclusive approach towards this kind of learning. At a professional level, academic staff with teaching responsibilities can reflect on this study's findings and inform their own pedagogical practice with regards to group work learning. Working together can offer students many benefits and perhaps, more importantly, it enables students to form friendships and build enhanced peer social relationships and social networks.

At a research level, applying SNA combined with qualitative insights has proved to offer many advantages but challenges too. According to Deal, Purinton, and Waetzen (2009), SNA is different to other educational and social sciences methods as the unit of analysis is not the individual student but a group of students and the linkages or ties among them. In order to capture these interdependencies among students, advanced computing technology and graph knowledge, such as the R software, are needed which added another layer of complexity to analysing the data in this study. However, combining these advanced SNA insights with qualitative data is a considerable strength. This innovative and interdisciplinary approach has enabled us to address the research questions as fully as possible.

Therefore, it is necessary to conclude this study with a number of pedagogical recommendations. Based on the findings, discussion and personal reflection, the following recommendations are suggested:

- A commitment towards more inclusive pedagogy and ethos: more inclusive teaching and learning strategies that promote all students' individual learning needs should be implemented.
- Collaborative, relational and socially driven teaching practices and pedagogical arrangements in order to enhance social relationships and friendships between students.
- More support from tutors and more systematic planning of group work activities.
- Assessment of both the process and product of group work. Tighter monitoring of group work activities to ensure that students contribute equally.
- Rigorous marking of group work which should reflect individual contributions.
- Further promotion of group work throughout the programme, as students find it beneficial and useful.

At a micro level, these recommendations are directed towards the staff of the participating undergraduate programme. This research study has initiated a dialogue among colleagues as to how to ensure better and more inclusive delivery of group work activities. It is hoped that these research findings will be embedded within the design and delivery of modules. At a meso level, the recommendations can be useful to all programmes within the university. The dissemination of the results will provide many opportunities to academic staff across the university to inform their own practice. At a macro level, through wider dissemination, these recommendations can be useful to researchers and academics

across the sector. Even though this is a case study and findings cannot be generalised, they can be useful for those who engage with group work learning.

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No potential conflict of interest was reported by the author.

Notes on contributor

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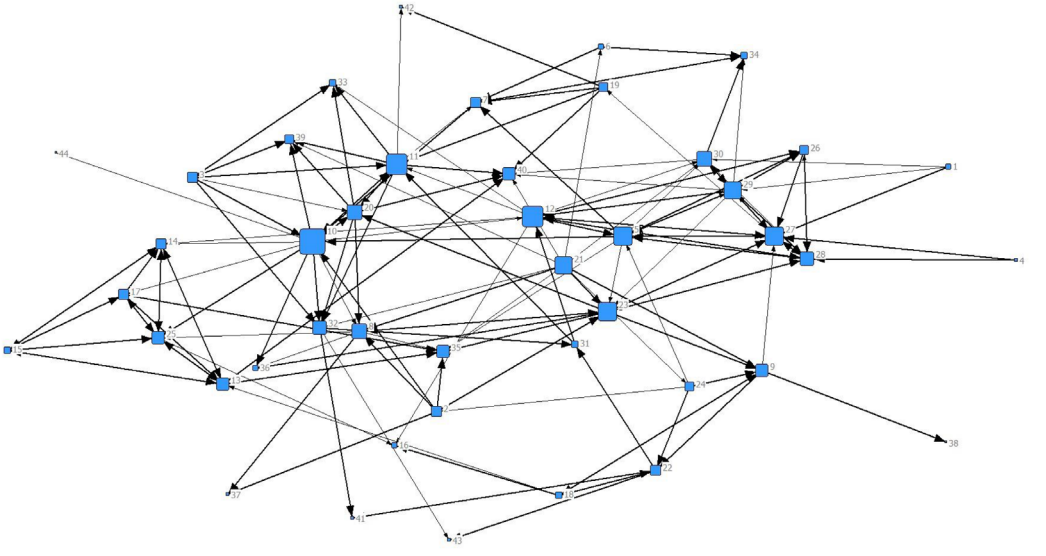
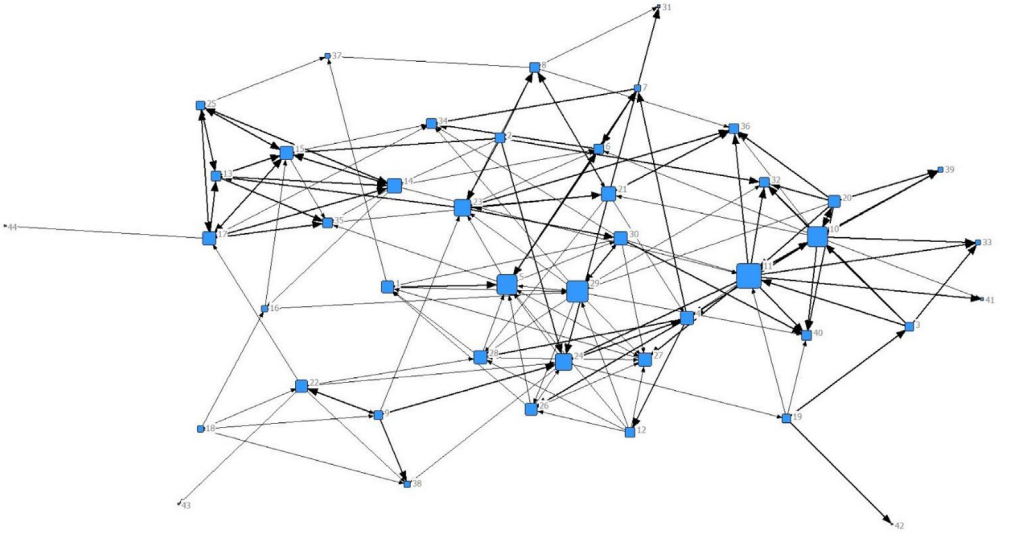
Appendices

Appendix 1

Year 1 friendships



Year 1 group work dynamics



Appendix 2